

## Case Report

### An Unusual Case of Ileal Obstruction Secondary to a Large Primary Enterolith

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#### ABSTRACT

Primary enterolith is also known as a gastrointestinal concretion. In this condition, stone formation occurs in small bowel. Enterolithiasis is an uncommon pathological condition in humans. Its prevalence is 0.3-10%. We present an uncomplicated case of primary enterolith in a small bowel. A 50-years old female patient came with abdominal pain due to small bowel obstruction and intestinal stricture on clinico-radiological correlation. After clinical examination and investigations, she was taken up for exploratory laparotomy wherein segment of ileum was resected and sent for histopathology examination.

**Keywords:** Enterolithiasis, Primary enterolith, Small bowel obstruction

#### INTRODUCTION

Enterolithiasis is an uncommon pathological condition that arises from intestinal stasis.<sup>1</sup> This entity is common among animals such as horses & zebras. Enterolith rarely causes bowel obstruction, hemorrhage and perforation but usually asymptomatic.<sup>2</sup> Its prevalence ranges from 0.3-10%.<sup>3</sup> We present a clinical case of small bowel obstruction who underwent an exploratory laparotomy and was diagnosed as primary enterolith in histopathology.

#### Case History

A 50-years old Muslim non-vegetarian, mentally sound female patient presented to emergency department with chief complaints of abdominal pain and single episode of non-bilious, non-projectile vomiting since past five days. She had constipation for past three days. Severe, colicky and continuous abdominal pain was started over right iliac fossa and hypogastrium radiating to whole abdomen. She was asymptomatic prior to this episode. No other comorbidities were present. She did not receive any calcium supplementation till date. No past or family history of tuberculosis.

On clinical examination, abdomen was soft but distended, bowel sounds were absent, tympanic note was noted. All routine blood investigations were within normal range except for increased serum C-Reactive Protein (167 ug/ml). On radiological preliminary CT-abdomen investigation, the patient was suspected to have small intestinal obstruction due to stricture which was 50 cm proximal to ileocecal junction. There was calcified structure within narrowed segment of ileum, suggestive of enterolith. No evidence of intestinal perforation/tumor/intussusception /liver lesion or lymphadenopathy. No evidence of gall-stones or calculi in renal system.

Patient underwent exploratory laparotomy for small intestinal stricture/obstruction. Exploratory laparotomy with ileal segmental resection followed by ileo-ileal anastomosis having viable margins was done. During the laparotomy procedure, enterolith was found near to the area of stricture which was 50 cm proximal to ileocecal junction. Post-operatively we received intact segment of small bowel (ileum) for histopathological examination.

Histopathology section received a part of ileal segment with attached mesentery measuring 11 cm in length with viable proximal and distal margins. On cut surface, loss of mucosal

folds due to ulceration seen. Sloughed necrotic areas noted within the intestinal mucosa (Figure-1). Impacted hard, black colored stone noted measuring 2.5 cm x 2.5 cm x 1 cm within the lumen at one side of stricture site. Thickness of intestinal segment was 0.8 cm at the enterolith site. There was no evidence of intestinal perforation or tumor or caseation necrosis or parasitic infestations. (Figure-2).

Distal margin and proximal margin were approximately 5 cm away from area of impacted stone. The attached mesentery appeared unremarkable on gross pathology. No lymph nodes noted in mesentery.



**Figure-1: Gross Photograph. Ileal segment reveals eroded mucosa and bowel stricture**

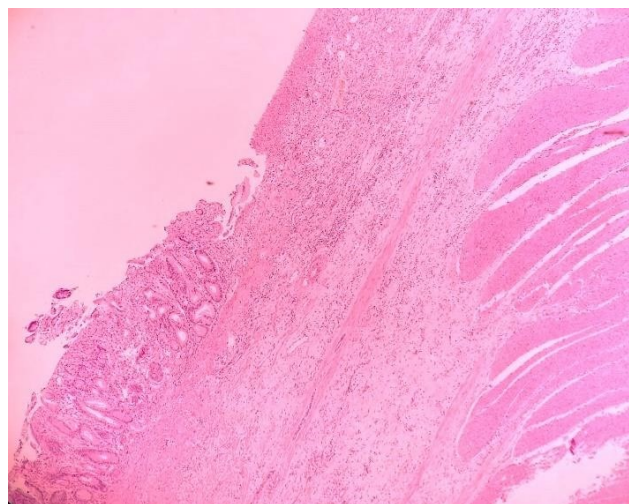


**Figure-2: Gross Photograph. Ileal segment with impacted enterolith measuring 2.5 cm x 2.5 cm x 1 cm**

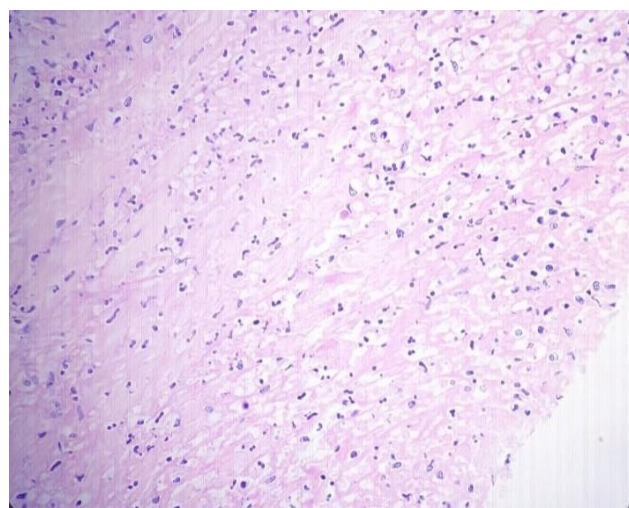
On microscopy, the segment of ileum revealed ulcerated mucosa (Figure-3). Mucosa at the site of stone impaction was edematous and necrotic with presence of mixed inflammatory cell infiltrate in lamina propria of mucosa and

submucosa reaching up to sub-serosa. Area of ischemic coagulative necrosis noted in mucosa and submucosa due to impacted enterolith that hampered local blood-circulation. (Figure-4).

No evidence of caseating epithelioid cell granuloma/ atypia/ malignancy/ parasitic infestation in submitted intestinal segment. ZN stain was negative for Acid fast bacilli (Negative for intestinal tuberculosis). Based on these findings, the histopathological diagnosis of Enterolithiasis with ischemic coagulative enteritis (ileal segment) was made.



**Figure-3: Microphotograph. Ileal segment reveals partial mucosal ulceration, dense mixed inflammatory infiltrate in all layers of intestine. Serosa not depicted in this image (H&E, x 100)**



**Figure-4: Microphotograph. Ileal segment showing ischemic coagulative necrosis with mixed inflammatory infiltrate at the stone impaction site (H&E, x 400)**

## DISCUSSION

Enterolithiasis (stone formation in intestine) is a rare condition in humans. It was first described by a French physician Chomelin J in 1710 as a case of stone formation in duodenal diverticulum.<sup>1</sup>

Enterolithiasis is divided into two types- 'primary and secondary'. Primary enterolithiasis forms within gastrointestinal tract due to altered anatomical integrity resulting in intestinal stasis. Congenital and acquired primary conditions can lead to its pathogenesis. Acquired causes include intestinal tuberculosis/fistula (ruled out in this case), intestinal fistula, complicated hernia with intestinal contents, diverticular diseases, Inflammatory bowel disease like Crohn's disease. In our case, the stricture led to intestinal stasis and then enterolith.

Apart from above causes, aberrant intestinal motility disorders like ischemic enteritis (bacterial), aganglionosis of intestine can lead to the same. Bacterial colonies were not seen in our biopsy. After gastrointestinal surgeries like enteric anastomosis, intestinal adhesions such enterolith can occur. Our case never had any gastrointestinal surgery in the past. Long- term dietary supplementation of calcium has been controversially put forth as a causative factor of enterolith in humans. Such supplementation is allegedly more in frequent non- vegetarians.<sup>2</sup> This signifies the importance of chemical analysis of enterolith on hard-core non-vegetarian subjects or those on calcium drug supplementation.

Primary enterolithiasis is further divided into two types: 'true and false'. True primary enterolith made up of substances in chyme in normal bowel. These can be cholic acid stones or calcium stones (calcium phosphate, calcium oxalate, calcium carbonate). Cholic acid stones require low pH and are found in proximal intestine. The calcium stones are found in terminal ileum and requires alkaline pH for its pathogenesis.<sup>3,4</sup> False primary enterolith are based on type of material and are further divided into three subtypes (bezoars, varnish, insoluble salts).<sup>2,4</sup> Secondary enterolithiasis are formed in the 'organs outside the gastrointestinal tract' like gall- bladder, urinary system that have migrated into gastrointestinal system through fistulation.<sup>2-4</sup>

In secondary enterolith, the most common is gallstone due to cholecysto-duodenal or cholecysto-jejunal fistula that leads to condition called gallstone ileus. It accounts for less than 5% of mechanical small bowel obstruction.<sup>3</sup>

Among all acute surgical emergencies presenting with enterolith, 21.8% are related to intestinal obstruction. Abdominal pain, distention, constipation, and vomiting are the salient features of intestinal obstruction, just like in our case.<sup>5</sup> Radiological diagnoses of enterolith is rarely done

however usually calcified stones can be detected. Therefore, diagnosis is made mostly during preliminary radiology test. For non-calcified enterolith yet to get calcified or smaller sized enterolith, exploratory laparotomy is helpful.<sup>6</sup>

Enterolithiasis in Crohn's disease is secondary to stricture formation. Our case is an example of primary enterolith which developed proximal to stricture without Crohn's disease.<sup>7</sup> Curative treatment is to crush and milk the enterolith down to colon, if small. Other options include enterotomy with stone extraction or intestinal segmental resection. In small bowel obstruction when there is no evidence of gallstone ileus or malignancy, enteroliths must be differential diagnosis. Definitive treatment is surgery (enterotomy or resection).<sup>8</sup> In our case, exploratory laparotomy with intestinal resection of involved segment was done with subsequent ileo-ileal anastomosis.

## CONCLUSIONS

Small bowel obstruction due to enterolith is a rare condition. Bowel environment and motility plays an important role in pathogenesis of enterolith. Patient can be symptomatic or asymptomatic. To prevent further complication such as perforation and hemorrhage; multi- modality diagnostic procedures and multi-disciplinary team work is needed. Surgery is a definitive treatment for large impacted size stones. Histopathology is final aid in its diagnosis as only calcified stones can be picked on radiological investigations like CT-abdomen.

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